AMAG plates for shipbuilding applications

As a consequence of the increasing demands regarding lightweight construction in the shipbuilding area, aluminium is being used for a growing number of applications. Therefore, as of now, AMAG offers plate for shipbuilding applications.

Reductions in the weight of vessels and hence savings with regard to fuel and CO_2 emissions, as well as an increase in transport capacity at unchanged size, means that an increasing volume of aluminium is being employed.
For many years, AMAG has been supplying high quality, 5083 and 5086 alloy plates. To date, these have been available in O (soft), H111 (soft straightened or stretched) and H112 (hot rolled) tempers. However, as a consequence of the resultant demand, the naturally hard material product portfolio has now been supplemented with the **¼-hard-corrosion-resistant temper (H116/H321)**. This means that, with immediate effect, top quality plates in the given alloys (Table 1) can now be ordered from AMAG.

Quality born of know-how

As a result of special adjustments to the production parameters such as special hot rolling, stretching and annealing processes, 5xxx plates are manufactured in a high-strength, stable temper (Table 2). In addition, sensitive and precisely defined treatment methods such as those employed for aerospace plates are utilized for the creation of a material with outstanding corrosion resistance characteristics.

AMAG shipbuilding plates can withstand both, layer corrosion (test pursuant to ASTM G66) and inter-crystalline corrosion (test pursuant to ASTM G67). ■

The advantages

These high-strength, naturally hard alloys offers first class recyclability and excellent, straightforward processing such as milling, bending and welding. It is also corrosion-resistant and therefore durable and service-friendly. The use of aluminium reduces vessel weight and thus permits the achievement of higher speeds, greater payloads, lower fuel consumption and excellent manoeuvrability.

The applications

Welded constructions, internal and external structural parts, platforms, decks and planking, e.g. for yachts, ferries, catamarans, various naval boats, speedboats, fishing boats, etc., as well as all other areas where seawater-resistant materials are required.

Abb.: ASSET Test (Test Method of Visual Assessment of Exfoliation Corrosion Susceptibility) pursuant to ASTM G66

Tab. 1: Chemical composition (weight %) acc. to EN 573-3:

										Others	
Alloy		**Si**	**Fe**	**Cu**	**Mn**	**Mg**	**Cr**	**Zn**	**Ti**	**Each**	**Total**
EN AW-5083	max.	0.40	0.40	0.10	0.40-1.0	4.0-4.9	0.05-0.25	0.25	0.15	0.05	0.15
EN AW-5086	max.	0.40	0.50	0.10	0.20-0.7	3.5-4.5	0.05-0.25	0.25	0.15	0.05	0.15

Tab. 2: Typical mechanical properties and dimensions

	5083 H116/ H321	**5086 H116**
Tensile Strength R_m [MPa]	320	290
Yield Strength $R_{P0,2}$ [MPa]	220	200
Elongation A_5 [%]	17	13
Thickness	19 - 102 mm	
Width*	max. 1520 mm	
Length*	max. 6100 mm	
*) other widths and lengths on request		